

The Examiner is respectfully requested to amend the above-identified application as follows:

IN THE CLAIMS:

Please amend Claims 1, 11, and 18, and add Claims 19-24, to read as follows (a marked-up version of the amended claims, showing the changes made thereto, is attached).

Sub C-7
1. (Amended) An ink jet printing apparatus for forming an image on a print medium by using a print head, the print head having a plurality of nozzle groups, each having a plurality of nozzles for printing a same color, the ink jet printing apparatus comprising:

an image formation means for performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium and for forming the image onto the same main scan print area by using different nozzle groups of the ink jet head in the plurality of scanning operations, wherein different thinning out mask patterns are used in the plurality of scanning operations for printing onto the same main scan print area, and a thinned out image according to the different thinning out mask patterns is formed onto the same main scan print area by the different nozzle groups during the plurality of scanning operations; and

a printing duty determining means for dividing the same scan print area into a plurality of divided areas in a sub-scan direction different from a main scan direction, and for determining the printing duty of each of the plurality of divided areas, the printing duty being determined from the thinning out mask pattern,

wherein the printing duty determining means performs the thinning

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out process by the thinning out mask pattern so that the printing duty of one of the divided areas and the printing duty of another of the divided areas are different from each other.

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11. (Amended) An ink jet printing method for forming an image on a print medium by using a print head, the print head having a plurality of nozzle groups, each having a plurality of nozzles, the ink jet printing method comprising the steps of:

performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium and forming the image onto the same main scan print area by using different nozzle groups of the ink jet head in the plurality of scanning operations, wherein different thinning out mask patterns are used in the plurality of scanning operations for printing onto the same main scan print area, and a thinned out image according to the different thinning out mask patterns is formed onto the same main scan print area by the different nozzle groups during the plurality of scanning operations, and

dividing the same scan print area into a plurality of divided areas in a sub-scan direction different from a main scan direction, and determining the printing duty of each of the plurality of divided areas, the printing duty being determined from the thinning out mask pattern,

wherein, the printing duty of one of the divided areas and the printing duty of another of the divided areas are different from each other.

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18. (Amended) A printing control method for an ink jet printing apparatus, the ink jet printing apparatus having a plurality of nozzle groups, each having a plurality of nozzles, the printing control method comprising the steps of:

providing the printing apparatus;

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performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium and forming the image onto the same main scan print area by using different nozzle groups of the ink jet head in the plurality of scanning operations, wherein different thinning out mask patterns are used in the plurality of scanning operations for printing onto the same main scan print area, and a thinned out image according to the different thinning out mask patterns is formed onto the same main scan print area by the different nozzle groups during the plurality of scanning operations, and

dividing the same scan print area into a plurality of divided areas in a sub-scan direction different from a main scan direction, and determining the printing duty of each of the plurality of divided areas, the printing duty being determined from the thinning out mask pattern,

wherein, the printing duty of one of the divided areas and the printing duty of another of the divided areas are different from each other.

19. (New) An ink jet printing apparatus for forming an image on a print medium by using a print head, the print head having a plurality of nozzle groups, each having a plurality of nozzles for printing a same color, the ink jet printing apparatus comprising:

image formation means for performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium and for forming the image onto the same main scan print area by using different nozzle groups of the ink jet head in the plurality of scanning operations, wherein different thinning out mask patterns are used in the plurality of scanning operations for printing onto the same main scan print area, and a thinned out image according to the different thinning

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out mask patterns is formed onto the same main scan print area by the different nozzle groups during the plurality of scanning operations; and

printing duty determining means for dividing the same scan print area into a plurality of divided areas in a sub-scan direction different from a main scan direction, and for determining the printing duty of each of the plurality of divided areas, the printing duty being determined from the thinning out mask pattern,

wherein the printing duty determining means performs the thinning out process by the thinning out mask pattern so that the printing duty of one of the divided areas and the printing duty of another of the divided areas are different from each other,

wherein the thinning out mask pattern is a pseudo-periodical mask pattern in which, when pixels are digitized according to an arbitrary level, unprinted pixels and printed pixels are uniformly distributed.

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20. (New) An ink jet printing apparatus for forming an image on a print medium by using a print head, the print head having a plurality of nozzle groups, each having a plurality of nozzles for printing a same color, the ink jet printing apparatus comprising:

image formation means for performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium and for forming the image onto the same main scan print area by using different nozzle groups of the ink jet head in the plurality of scanning operations, wherein different thinning out mask patterns are used in the plurality of scanning operations for printing onto the same main scan print area, and a thinned out image according to the different thinning out mask patterns is formed onto the same main scan print area by the different nozzle groups during the plurality of scanning operations; and

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printing duty determining means for dividing the same scan print area into a plurality of divided areas in a sub-scan direction different from a main scan direction, and for determining the printing duty of each of the plurality of divided areas, the printing duty being determined from the thinning out mask pattern,

wherein the printing duty determining means performs the thinning out process by the thinning out mask pattern so that the printing duty of one of the divided areas and the printing duty of another of the divided areas are different from each other,

wherein the apparatus further includes a striped density variation amount detection means for detecting an amount of striped density variation occurring in an image formed by the print head, wherein the striped density variation amount detection means has a control unit to cause the print head to print a predetermined test image, a reading unit to read the printed test image by using an optical sensor, a calculation unit to determine the amount of striped density variation of the print head based on the result of the reading, and a register to store the calculated result produced by the calculation unit.

21. (New) An ink jet printing method for forming an image on a print medium by using a print head, the print head having a plurality of nozzle groups, each having a plurality of nozzles, the ink jet printing method comprising the steps of:

performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium and forming the image onto the same main scan print area by using different nozzle groups of the ink jet head in the plurality of scanning operations, wherein different thinning out mask patterns are used in the plurality of scanning operations for printing onto the same main scan print area, and a thinned out image according to the different thinning out mask patterns is formed onto the same main scan print area by the different nozzle groups during the

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plurality of scanning operations, and dividing the same scan print area into a plurality of divided areas in a sub-scan direction different from a main scan direction, and determining the printing duty of each of the plurality of divided areas, the printing duty being determined from the thinning out mask pattern,

wherein, the printing duty of one of the divided areas and the printing duty of another of the divided areas are different from each other,

wherein, the thinning out mask pattern is a pseudo-periodical mask pattern in which, when pixels are digitized according to an arbitrary level, unprinted pixels and printed pixels are uniformly distributed.

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22. (New) An ink jet printing method for forming an image on a print medium by using a print head, the print head having a plurality of nozzle groups, each having a plurality of nozzles, the ink jet printing method comprising the steps of:

performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium and forming the image onto the same main scan print area by using different nozzle groups of the ink jet head in the plurality of scanning operations, wherein different thinning out mask patterns are used in the plurality of scanning operations for printing onto the same main scan print area, and a thinned out image according to the different thinning out mask patterns is formed onto the same main scan print area by the different nozzle groups during the plurality of scanning operations, and dividing the same scan print area into a plurality of divided areas in a sub-scan direction different from a main scan direction, and determining the printing duty of each of the plurality of divided areas, the printing duty being determined from the thinning out mask pattern,

wherein, the printing duty of one of the divided areas and the

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printing duty of another of the divided areas are different from each other,

wherein the method also includes a step of detecting an amount of striped density variation occurring in an image formed by the print head, wherein the striped density variation amount detection step has a step of causing the print head to print a predetermined test image, a step of reading the printed test image by using an optical sensor, a calculation step of determining the amount of striped density variation of the print head based on the result of the reading, and a step of storing the calculated result produced by the calculation step.

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23. (New) An ink jet printing apparatus for forming an image on a print medium by using a print head, the print head having a plurality of nozzle groups, each having a plurality of nozzles for printing a same color, the ink jet printing apparatus comprising:

means for performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium; and

means for forming a thinned out image according to different thinning out mask patterns onto the same main scan print area by using different nozzle groups of the ink jet head in each of the plurality of scanning operations, the different thinning out mask patterns being used in the plurality of scanning operations for printing onto the same main scan print area:

wherein each of different thinning out mask patterns has a plurality of areas corresponding to each of a plurality of areas formed by dividing the same main scan print area in a sub-scan direction different from a main scan direction; and

wherein each of the plurality of areas in the thinning out mask pattern has thinning out rates and the thinning out rate of one of the areas and the thinning

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out rate of another of the areas are different from each other.

24. (New) An ink jet printing method for forming an image on a print medium by using a print head, the print head having a plurality of nozzle groups, each having a plurality of nozzles for printing a same color, the ink jet printing apparatus comprising the steps of:

performing a plurality of main scans by scanning the ink jet head relatively with respect to a same main scan print area of the print medium; and

forming a thinned out image according to different thinning out mask patterns onto the same main scan print area by using different nozzle groups of the ink jet head in each of the plurality of scanning operations, the different thinning out mask patterns being used in the plurality of scanning operations for printing onto the same main scan print area:

wherein each of different thinning out mask patterns has a plurality of areas corresponding to each of a plurality of areas formed by dividing the same main scan print area in a sub-scan direction different from a main scan direction; and

wherein each of the plurality of areas in the thinning out mask pattern has thinning out rates and the thinning out rate of one of the areas and the thinning out rate of another of the areas are different from each other.

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